



Astronomy Club News

March, 2004

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Jim McKeegan, President
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The February 21st observation session was canceled due to poor weather but a dinner meeting at the Liberty Diner was held instead. Ten people attended. We enjoyed talking about all things astronomy as well as good food. Brian Deis has formed Orange County Astronomical Association. He would like to work out a few dates in May where our members would visit his observatory in Chester and then the members of the Orange County club could visit the Walnut Mountain site. The February 28th observations session was held at Walnut Mountain Park. Six people attended. For most of the night the sky was clear and steady. An intermittent wind picked up at times though. We spent some time observing the first gibbous moon. Many lunar surface features were viewed including the Straight Wall and the Alpine Valley. Saturn and at least five of its moons were viewed. Some deep sky objects were viewed as well although their details were lessened by the moonlight. The open clusters M44, M50, M93, and M48 provided some of the best deep sky views. The highlight of the evening was a shadow transit of Io on Jupiter. The moons shadow appear as a small dark spot on Jupiters disk.

The Northeast Astronomy Forum will be held at Rockland County Community College on April 17th and 18th. Our club has been offered a free space for a table on the balcony for the show. Last year we went on Saturday. Anyone wishing to volunteer to man the table can contact John at kocis@verizon.net. The table worked out well for us last year and gave the club some exposure. We handed out observing schedules and newsletters as well as NASA literature. We will also contribute a set of NASA CDs as well as a NASA card game to the NEAF door prizes.

The March observation sessions are scheduled for the 13th and the 20th. The observing dates for the remainder of the year are listed below. The proposed date of April 17th may be moved due to NEAF. April 10th may be substituted.

4/17, 4/24, 5/15, 5/22, 6/12, 6/19, 7/10, 7/17, 8/7, 8/14, 9/11, 9/

18, 10/9, 10/16, 11/6, 11/13, 12/4, 12/11

Each month the photo section of our newsletter will highlight the telescopes and equipment of club members. If you have a photo of your scope or equipment and a brief description of it that you would like to contribute please send it to John at kocis@verizon.net.

The club has selection of astronomy books, Stardate audio CDs, a Macintosh computer with astronomy software, and a Meade 8 inch reflector for members to borrow. Please contact John at 791-5240 or kocis@verizon.net if you are interested in borrowing any of these.

Astronomy News:

Here are some articles from various sources that might be of interest.

NEWS RELEASE: 2004-069 Feb. 24, 2004

'And the Laurel Goes to...The Spitzer Space Telescope!' Aviation Week & Space Technology magazine has honored the teams that built NASA's new Spitzer Space Telescope with a 2003 Aerospace Laurel award. The awards, now in their 47th year, recognize outstanding achievements in the global field of aerospace.

Team members at NASA's Jet Propulsion Laboratory, Pasadena, Calif., and Ball Aerospace & Technologies Corp., Boulder, Colorado, won in the "Space" category for redesigning Spitzer, which saved \$800 million and provided a powerful new instrument for studying the universe.

Formerly known as the Space Infrared Telescope Facility, the Spitzer Space Telescope uses state-of-the-art infrared, or "heat-sensing," detectors to peer into the farthest, darkest and coolest reaches of space. To do this, it needs to stay cool; heat emitted by the spacecraft can interfere with its infrared detectors.

Engineers and scientists at JPL and Ball, building on an idea

by Spitzer team member Dr. Frank Low of the University of Arizona, Tucson, solved this cooling problem with a clever redesign of past telescopes housed in large “thermos bottles.” They shrank the thermos bottle to hold only the science instruments and the coolant, and planned for the first-ever Earth-trailing orbit, which takes Spitzer farther away from Earth’s warmth. This innovative “warm launch” architecture allows the chilliness of space to do most of the cooling. Launched in August 2003, the Spitzer Space Telescope is the fourth of NASA Great Observatories, a program that also includes the Hubble Space Telescope, Chandra X-ray Observatory and Compton Gamma Ray Observatory. JPL manages the Spitzer mission for NASA’s Office of Space Science, Washington. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology in Pasadena. JPL is a division of Caltech. Additional information about the Spitzer Space Telescope is available at <http://www.spitzer.caltech.edu> .

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How to Make Your Own Eye-Popping 3-D Pictures

Since settling in on the red planet, the Mars Exploration Rovers Spirit and Opportunity have sent back a number of 3-D postcards to countless fans outfitted in red- and blue-tinted spectacles. To some, the realistic pictures of the rocky martian terrain may seem magical, but the concept behind the illusion is in fact quite simple.

”Basically, 3-D pictures trick your brain into doing what it does all the time in the real world,” says Zareh Gorjian, a graphic artist at NASA’s Jet Propulsion Laboratory who makes 3-D pictures and animations of Mars for a living, both the black-and-white kind and the more advanced color versions.

So simple is the trick that, with a little effort, anybody with a camera, a computer equipped with photo-editing software, and a pair of tinted glasses can make their own 3-D pictures of Mars, family members, pets or anything else worth placing in

front of a lens.

Gorjian, who has been toying with the technique for 10 years, transforms all sorts of pictures into 3-D feasts for the eyes, including his latest vacation photos. "It's just fun," he says. The key to 3-D imaging lies in simulating a left and right eye. For the Mars Exploration Rovers, this is accomplished with the aid of a left and right camera eye. Images from the rovers' stereo camera lenses (either the hazard-avoidance cameras, the navigation cameras or the panoramic cameras) are tinted in red and blue, then merged into one blurred picture, which pops off the page when viewed through a pair of red- and blue-tinted glasses.

"Your brain thinks it is seeing two separate left and right images and so does what it always does — combines them into one picture," says Gorjian.

These basic 3-D photos are called anaglyphs and work best when viewed in black and white. Color anaglyphs are trickier because red and blue objects appear only to one eye. "You give up full color when you use the red and blue glasses," says Gorjian.

Instead, he and his colleagues at JPL's Multimission Image Processing Laboratory create 3-D color photos using two sophisticated techniques: polarization and infrared-transmission. In polarization, the light from left and right eye images is polarized, or made to travel in opposing, perpendicular directions. In infrared-transmission, left and right eye images are flickered back and forth on a special screen faster than an eye can blink. Both strategies require specialized glasses for viewing.

But black-and-white 3-D images do not require fancy tools or equipment and can be snapped and clicked into being by following these directions recommended by Gorjian:

Step 1

Start out by picking a subject. People are a good place to begin because they tend to pop out in 3-D photos. Place the subject in a setting with a lot of angles and depth (not in front of

a flat wall), and about 10 to 15 feet from the camera. Hold the camera steady by securing your elbows in your chest and snap a picture. Make sure your subject stays very still, then step just a tiny bit to the right, about the distance between your eyes or less, and take the same picture. When you slide over for the second shot, you — and most importantly your camera — should move in a parallel line.

Note: If Mars is your subject, the pictures have already been taken for you. Scan through the raw images on the JPL web site <http://marsrovers.jpl.nasa.gov> and pick out left and right eye images for your favorite photo (only images taken by the rovers' navigation cameras, hazard-avoidance cameras and panoramic cameras come in pairs). The stereo images will look identical, but you can tell if an individual image is from the left or right camera eye by clicking on it and looking at the file name displayed in the web address bar. Left camera eye image file names will contain the letter "L" four characters in from the end, and right eye image file names will similarly carry an "R." Two raw image examples can be found at

<http://marsrovers.jpl.nasa.gov/gallery/all/2/n/043/2N130199337EFF0700P1817R0M1.HTML>,
and <http://marsrovers.jpl.nasa.gov/gallery/all/2/n/043/2N130199337EFF0700P1817L0M1.HTML>.

Step 2

The next step involves transferring the images into photo-editing software. Any program will work as long it allows for red, blue and green color channels to be manipulated independently. The following instructions will refer to Adobe Photoshop. If your pictures are digital, just open them up in the software. If your pictures are hardcopies, transfer them to a computer using a scanner, or drop them off at a photo-developing store and ask for digital files (any file type will work).

Step 3

Once the left and right eye pictures are open, convert them both to grayscale by clicking on the 'Image' menu bar and selecting 'mode' then 'grayscale'. Next, assign the left eye

image red, green and blue channels by going back to the 'Image' menu bar and selecting 'mode' then 'RGB' (the image will still appear gray). Do not repeat this step for the right eye image.

Step 4

Now you are ready to merge the left and right images. To begin, make sure the left eye image is still selected. Open the channels display menu by clicking on the 'Window' menu bar and choosing 'channels.' Highlight the blue and green channels (press the shift key to highlight both at the same time).

Important: only the blue and green channels should be shaded blue. At this stage it doesn't matter which boxes to the left of the channels show eyeballs (eyeballs indicate which channels are displayed).

Step 5

Go back to the right eye image, select the whole thing (go to 'Select' menu bar, then press 'all') and copy it (go to 'Edit' menu bar, then press 'copy'). Switch back to the left eye image and paste (go to 'Edit' menu bar, then press 'paste'). Now, highlight the RGB color channel; an eyeball should appear in all four channel boxes. At this point, you should see a blurred red and blue picture.

An alternative to this step is to use only the blue channel instead of the blue and green when pasting into the left eye image.

Step 6

You are almost done. But first the left and right eye images need to be better aligned. Start by highlighting only the red channel in the channels display menu (it should be shaded blue). The next step is crucial because it allows the red-tinted picture to be shifted over while the blue-tinted picture is still visible. Go to the RGB channel and click only on the square box to the left. An eyeball should appear in all four boxes, but only the red channel should be shaded. Now pick a point in the center of the picture to match up; for example, if a person is your subject, eye pupils are a good target. Zoom in on the target by selecting the magnifying glass icon in the tool bar

then click on the target until it appears fairly large.

Step 7

Next, select the 'move' tool located in the upper right corner of the tool bar. Using the up and down arrow keys, slide the red-tinted image over until your target matches up and no longer shows any rings of color.

Step 8

Zoom back out. Objects toward the outside of your picture should still be haloed in red or blue. In other words, the overall goal in this step is to limit the colored tints as much as possible. To cut out excess red or blue at the far edges of your picture, crop it using the crop tool, also located in the tool bar (once you've outlined your picture with the tool, go to the 'Image' menu bar then press 'crop').

Your creation is ready to be viewed! Just don your paper glasses (the left eye should be tinted red) and watch the picture jump out at you from your monitor screen or a printed picture.

Release: 2004-065 February 19, 2004

Spacecraft to Launch, Designed to Harpoon Cosmic 'Moby Dick'

Like the massive white whale in Herman Melville's 1851 classic "Moby Dick," comets have long been considered swift, elusive harbingers of change. So it should be of little surprise that one of the best ways for scientists to study the mysteries of comets is to harpoon one.

The European Space Agency's Rosetta spacecraft is scheduled

to lift off on Feb. 26, 2004, at 2:16 am Eastern time, from the Kourou spaceport in French Guiana, on the northeastern coast of South America. The launch will be the beginning of a ten-and-a-half year odyssey to comet Churyumov-Gerasimenko

that includes flybys of Mars (2007) and the Earth (2005, 2007 and 2009).

Among the instruments aboard the Rosetta spacecraft are

three instruments funded by NASA and a key component of a fourth. The NASA instruments will examine Churyumov-Gerasimenko from the orbiter.

"This comet has only about three-hundred-thousandths the gravity of Earth," said Dr. Claudia Alexander, project scientist for the U.S. role in the mission, from NASA's Jet Propulsion Laboratory Pasadena, Calif. "The Rosetta spacecraft will be able to make observations from as close as 2 kilometers (1.2 miles). The data from our state-of-the-art instruments will be amazing," she added.

Rosetta will reach Churyumov-Gerasimenko, a four-kilometer-diameter (2.5-mile) comet, in May 2014. When this rendezvous occurs, Churyumov-Gerasimenko will be about three times as far from the sun as Earth is. Over the next 18 months Rosetta will study how the comet changes as it moves closer to the sun. In November 2014, Rosetta will drop its experiment-laden, harpoon-firing lander on Churyumov-Gerasimenko's icy nucleus.

"What you have to understand is that comets are primordial remnants of the early solar system," explained Dr. Paul Weissman of JPL. "They are the keys to understanding the way the whole solar system, our Earth, and how even we came into being. And with Rosetta we will be able to observe, study and analyze this primordial material up close for more than a year," he said.

JPL supplied the Microwave Instrument for Rosetta Orbiter, the first of its type on any interplanetary mission. This instrument can reveal the abundances of selected gases, their temperatures, the speed at which they are coming off the nucleus, and the temperature of the nucleus. Scientists will use the instrument to monitor changes in how vapors are released from the nucleus as the coma and tail grow. They will be studying water, carbon monoxide, ammonia and methanol, four of the most abundant gases from comets. Dr. Samuel Gulikis of JPL's Earth and Space Sciences Division is principal investigator.

The Southwest Research Institute, based in San Antonio, supplied two NASA instruments for Rosetta. One is an imaging telescope/spectrometer capable of analyzing the composition both of gases released by the comet and of the comet's surface. A goal of scientists using the instrument is to learn about

the temperatures at which comets form and evolve, by determining the relative abundance of noble gases, such as helium, neon and argon. Principal investigator for the ultraviolet instrument is Dr. Alan Stern of the institute's Space Studies Department in Boulder, Colo.

Dr. James Burch, of the Institute's Instrumentation and Space Research Division, San Antonio, is principal investigator for Rosetta's Ion and Electron Spectrometer.

This device will measure the environment of charged particles surrounding comet Churyumov-Gerasimenko. It will also study the interaction

between that environment and the solar wind of charged particles speeding outward from the Sun.

Key electronics for a fourth instrument, the Rosetta Orbiter Spectrometer for Ion and Neutral Analysis, have been supplied by Lockheed Martin Advanced Technology Center, Palo

Alto, Calif. This instrument will examine gases surrounding the comet.

JPL, a division of the California Institute of Technology in Pasadena, manages the microwave instrument for NASA's Office

of Space Science, Washington, D.C.

For information about the Rosetta mission visit:

<http://www.esa.int/export/esaMI/Rosetta/index.html>

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IMAGE ADVISORY: 2004-57 Feb. 12, 2004

Spitzer Telescope Sends a Rose For Valentine's Day

Out of the dark and dusty cosmos comes an unusual valentine - a stellar nursery resembling a shimmering pink rosebud. This cluster of newborn stars, called a reflection nebula, was captured by state-of-the-art infrared detectors onboard NASA's new Spitzer Space Telescope, formerly known as the Space Infrared Telescope Facility.

The Valentine's Day image is available online at <http://www.spitzer.caltech.edu> and <http://photojournal.jpl.nasa.gov/catalog/PIA05266>.

"The picture is more than just pretty," said Dr. Thomas Megeath, principal investigator for the latest observations and an astronomer at the Harvard Smithsonian Center for Astrophysics, Cambridge, Mass. "It helps us understand how stars form in the crowded environments of stellar nurseries." Located 3,330 light-years away in the constellation Cepheus and spanning 10 light-years across, the rosebud-shaped nebula, numbered NGC 7129, is home to some 130 young stars. Our own Sun is believed to have grown up in a similar family setting.

Previous images of NGC 7129 taken by visible telescopes show a smattering of hazy stars spotted against a luminescent cloud. Spitzer, by sensing the infrared radiation or heat of the cluster, produces a much more detailed snapshot. Highlighted in false colors are the hot dust particles and gases, respectively, which form a nest around the stars. The pink rosebud contains adolescent stars that blew away blankets of hot dust, while the green stem holds newborn stars whose jets torched surrounding gases.

Outside of the primary nebula, younger proto-stars can also be seen for the first time. "We can now see a few stars beyond the nebula that were previously hidden in the dark cloud," said Megeath.

In addition, the findings go beyond what can be seen in the image. By analyzing the amount and type of infrared light emitted by nearly every star in the cluster, scientists were able to determine which ones support the swirling rings of debris, called circumstellar discs, which eventually coalesce to form

planets. Roughly half of the stars observed were found to harbor discs.

These observations will ultimately help astronomers determine how stellar nurseries shape the development of planetary systems similar to our own.

Launched on August 25, 2003, from Cape Canaveral Air Force Station, Florida, the Spitzer Space Telescope is the fourth of NASA's Great Observatories, a program that also includes the Compton Gamma Ray Observatory, Chandra X-ray Observatory and Hubble Space Telescope.

JPL manages the Spitzer Space Telescope mission for NASA's Office of Space Science, Washington, D.C. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology in Pasadena. JPL is a division of Caltech.

Additional information about the Spitzer Space Telescope is available at <http://www.spitzer.caltech.edu> .

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Mid Evening Observing Highlights for March

Saturn can be found high in the western sky. Jupiter is in the eastern sky. The Beehive Cluster (M44) in Cancer is directly overhead. There are many open clusters that can be viewed in the southern sky such as M41, M46, M47, M48, and M50. Leo and Virgo are rising in the eastern sky. The Big Dipper is standing on its handle in the northeastern sky. The bright star Arcturus can be seen rising in the east just above the horizon. Spring is the time of year to observe galaxies. Many can be found in Leo, Virgo, and Coma Berenices. Full moon is on March 6th and new moon is on March 20th. The image below shows the locations of M 41, M46, M47, M48, and M50.

wish I had the Cave set up!!!!

I think after this image I should retire.

Rolo



NASA Space Place

Deep Space Network 2-for-1 Sale!

By Patrick L. Barry

Call it a “buy one, get one free” sale for astronomers: Build a network of radio dishes for communicating with solar-system probes, get a world-class radio telescope with a resolution nearly as good as a telescope the size of Earth!

That’s the incidental bonus that NASA’s Deep Space Network (DSN) offers the astronomy community. Designed to maintain contact with distant spacecraft in spite of the Earth’s rotation, the large, widely spaced dishes of the DSN are ideal for performing a form of radio astronomy called “very long baseline interferometry” (VLBI).

VLBI produces very high resolution images of the cosmos by combining the output from two or more telescopes. The result is like having a giant “virtual” telescope as large as the distance between the real dishes! Since bigger telescopes can produce higher resolution images than smaller ones, astronomers need to use dishes that are as far apart as possible.

That need dovetails nicely with the DSN’s design. To maintain continuous contact with deep space missions, the DSN has tracking stations placed in California, Spain, and Australia. These locations are roughly equally spaced around the Earth, each about 120 degrees of longitude from the others-that way at least one dish can always communicate with a probe regardless of Earth’s rotation. That also means, though, that the straight-line distance between any two of the stations is roughly 85 percent of Earth’s diameter-or about 6,700 miles. That’s almost as far apart as land-based telescopes can be.

“We often collaborate with other VLBI groups around the world, combining our dishes with theirs to produce even better images,” says Michael J. Klein, manager of the DSN Science Office at NASA’s Jet Propulsion Laboratory. “Since our 70-meter dish in Canberra, Australia, is the largest dish in the southern hemisphere, adding that dish in particular makes a huge difference in the quality of a VLBI observation.”

Even though only about 1 percent of the DSN’s schedule is typically spared from probe-tracking duty and scheduled for radio astronomy, it manages to make some important contributions to radio astronomy. For example, the DSN is currently helping image the expanding remnant of supernova 1987A, and Dr. Lincoln Greenhill of the Smithsonian Astrophysical Observatory is using the DSN dishes to explore a new way to measure the distances and velocities of galaxies.

And all this comes as a “bonus” from the dishes of the DSN.

To introduce kids to multi-wavelength astronomy, NASA’s

website for kids, The Space Place, has just added the interactive demo, "Cosmic Colors," at spaceplace.nasa.gov/cosmic.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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The 2004 dues are due

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